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Issues and Options Related to the Reporting and Analysis of Retail Prices and Price Spreads for Beef

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ISSUES AND OPTIONS RELATED TO THE REPORTING AND ANALYSIS OF RETAIL PRICES AND PRICE SPREADS FOR BEEF. Commodity Economics Division, Economic Research Service, U.S. Department of Agriculture, Staff Report No. AGES871102.

ABSTRACT

Retail prices and price spreads for Choice beef have been published by USDA for over 50 years. These data are of interest to a wide range of groups, including market participants, consumers, researchers, and policymakers. The marketing of beef has changed dramatically over the past 20-30 years, resulting in changes in the mix of beef products being sold. As a consequence, conceptual price measurement problems have been raised regarding the validity of procedures used to derive retail prices and price spreads for beef. This report discusses some of the issues regarding the current reporting of retail beef prices and price spreads and presents options for adapting current procedures to reflect changes in product mix and marketing practices for beef.

Keywords: Retail prices, price spreads, wholesale value, farm value, beef.

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SUMMARY

Retail prices and price spreads for Choice beef have been published by USDA for over 50 years. These data are of interest to a wide range of groups, including market participants, consumers, researchers, and policymakers. This report discusses some of the issues regarding the current reporting of retail beef prices and spreads. Of particular importance, changing market conditions and marketing practices imply the need to examine whether procedures used to derive retail prices and price spreads need to be adjusted.

Price spreads are a measure of the total difference between the price received by producers and the price paid by consumers. As such, they provide a breakout of the consumer food dollar into the farm value share and the marketing share. Retail price and price spread analysis can also provide insight into how price changes at one market level relate to price changes in other market levels. Further, retail Choice beef prices and price spreads are one set of information often used to give insight into the efficiency and market performance of the beef marketing system. However, additional information on costs and investment is required for a more accurate and complete analysis.

Over the past 20-30 years, dramatic changes have occurred in the form and way in which beef moves from packers to retail stores and food service outlets. These changes include:

- a transition from packers and wholesalers selling carcasses toward selling boxed beef, with more cutting and trimming occurring earlier in the marketing channel,
- more boneless cuts and the more recent trend to closer fat trimming,
- a larger service component in sales, particularly at the food service level but also in grocery products such as prepared foods and delicatessen sales, and
- greater importance of away-from-home food consumption.

As a result of these developments, the product mix of beef sold has changed over the years, with fresh or refrigerated beef declining in importance relative to total beef sales, while prepared foods, service delicatessens, and away-from-home consumption have increased their shares. The development of branded beef products could have additional implications for changing the nature of beef consumed and the mix of products over the next few years.

When new products or marketing practices are introduced, conceptual price measurement problems arise regarding the appropriateness of the representative goods chosen for pricing as well as the validity of aggregation weights.

Over the years, calculation procedures for deriving retail Choice beef prices and price spreads have been adjusted to reflect changes in data sources used and changes in industry characteristics. Such adjustments, however, have been made infrequently in order to preserve a consistent series over time. An important change occurred when the retail Choice beef price series returned to using BLS data in May 1981. This was prompted when the ERS Retail Meat Price Survey was discontinued after some methodological improvements had been made

in the data collection procedures used in the CPI price survey. These changes allow BLS to cover a wider sample of foods for pricing and provide for a better distribution of price sampling periods throughout the week and the month. Further, by changing one-fifth of the sample stores each year, this helps keep the sample more current regarding firms in the sample of stores and items priced, thereby allowing a gradual incorporation of new products. Since most of the beef sector developments have resulted in more highly processed and higher valued beef products, this implies a gradual move to higher reported average retail beef prices.

A number of issues related to the current procedures used for calculating retail beef prices and price spreads need to be re-examined and re-evaluated periodically. One of the more important issues is whether the currently published retail Choice beef price series is an appropriate composite indicator of consumer-level beef prices. This centers on the issue of whether current item and market coverage provides an adequate representation of the beef products now sold and consumed. Other retail price issues of importance are the appropriateness of the procedure used for weighting cuts in deriving the composite retail Choice beef price and the timeliness of the release of ERS retail Choice beef prices.

Major issues related to the value of beef at market levels prior to retail and to corresponding price spreads include the move to boxed beef at wholesale, implications of an all beef price series for farm and wholesale values and spreads, conversion factors, and the incorporation of lags into the calculation of spreads.

Seven options are presented to address these issues, ranging from discontinuing ERS calculation and reporting of price spreads to greatly expanding data collection, calculation, and reporting activities. In choosing among the options, the major question is how ERS can best serve the needs of our diverse public clientele subject to the constraints of data limitations, tightening budgets, and Agency resource allocations to other projects.

Finally, some general issues applicable to each option are discussed. The first issue considers increasing efforts to educate the public regarding the appropriate uses and interpretation of price spreads. The second issue addresses the question of incorporating lags into price spreads. Because there is widespread disagreement on this issue, even among members of this task force, this option considers publishing two series, one using concurrent prices and one incorporating lags.

Issues and Options Related to the Reporting and Analysis of Retail Prices and Price Spreads for Beef

INTRODUCTION

Retail prices for beef and corresponding price spreads to both the farm and wholesale levels have been published by the U.S. Department of Agriculture (USDA) for over 50 years. Most emphasis historically has centered on the price spread series. However, each component used to derive spreads--retail prices, wholesale values, and farm values--merits attention and is a useful data series.

This report discusses some of the issues regarding retail beef prices and spreads. Changing market conditions and marketing practices imply the need to examine procedures used to derive retail prices and price spreads. How the Economic Research Service (ERS) can best serve the data needs of our diverse clientele, subject to ongoing budget and data availability constraints, is also considered.

HISTORY OF USDA PUBLISHING RETAIL BEEF PRICES AND PRICE SPREADS

Beef price spreads receive greater emphasis than retail prices. Price spreads are a measure of the difference between the price received by producers and the price paid by consumers. Price spreads provide a breakout of the consumer food dollar into the farm value share and the marketing share. Congress, researchers, policymakers, industry participants, and the public are all interested in how the consumer's food dollar is allocated between farmers and the marketing system. By examining price spreads and their components, changes can be monitored over time. Retail price and price spread analyses also provide insight into how price changes in one market respond to price changes in other markets. Retail prices and price spreads are one set of information often used to analyze the efficiency and market performance of the beef marketing system. Additional information on costs and investment is also required for a more accurate and complete analysis.

Price spreads for beef have been computed since the early twenties when Congress asked USDA to undertake special studies of marketing margins for livestock. In 1934, at the request of livestock producers, USDA developed a statistical series to measure changes in marketing costs for a number of agricultural commodities. In March 1935, USDA published a preliminary report that summarized price spreads for beef, pork, and eight other foods for the

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This report was prepared by an Economic Research Service task force. Task force members were Terry L. Crawford, Lawrence A. Duewer, John A. Ginzel, Harry H. Harp, Kenneth E. Nelson, and Paul C. Westcott.

period 1910-34. A report was issued in 1936 on price spreads for 58 food items, including beef. Farm-to-retail price spreads for beef have been published regularly since 1942. They were initially published in Marketing and Transportation Situation (1942-75). They are published currently in Agricultural Outlook and Livestock and Poultry Situation and Outlook Report.

Enactment of the Research and Marketing Act of 1946 increased the attention given to measurement and analysis of marketing spreads and costs. Funds have been specifically appropriated for price-spread work since that time. In the appendix to the President's budget proposal for fiscal year 1988, part of ERS's funds is designated for work on price spreads:

> "not less than $350,000 of the funds contained in this appropriation shall be available to continue to gather statistics and conduct a special study on the spread between the farmer and the consumer."

Several organizations within USDA have been responsible for calculating Choice beef price spreads over the years, but ERS or the economics unit of ESCS and ESS has been responsible since 1962. While reorganizations changed branch names, responsibility for Choice beef price spreads has rested with the forerunners of the Food Marketing and Consumption Economics Branch (FMCE) and the Livestock, Dairy, and Poultry Branch (LD&P). FMCE works with price spreads for a market basket and nine product groups of U.S. farm-originated foods, including all fresh meat (recently only in index form). LD&P calculates price spreads for Choice beef, a separate series from that used in the FMCE market basket.

ERS Retail Meat Price Survey

USDA relies heavily on the Bureau of Labor Statistics (BLS), U.S. Department of Labor (USDL) as a source of average retail price data. These data are a byproduct from the monthly nationwide survey of prices collected by BLS for computing the Consumer Price Index (CPI). USDA has conducted retail price collection activities in the past. Retail price information for meats was first collected by USDA in the midfifties to supplement the prices for individual meat items available from BLS. The number of retail chains that USDA collected beef price information from grew until about 1962 when it reached a sample size of about 40 retail chain divisions, representing about 25 firms. The additional data from this study were not released but were used to make early estimates of the official series calculated from BLS data. These estimates were only released internally. A feedback report was prepared and returned to cooperating retail firms in the retail survey study. Average retail meat prices were first computed only monthly. In June 1964, weekly calculations were begun for beef and pork. These were used as preliminary estimates for the monthly retail prices.

The methodology used to compute composite retail prices for beef was revised in 1969 partially encouraged and guided by recommendations by the National Commission on Food Marketing (NCFM). The new procedure attempted to correct for volume effects on prices attributable to advertised specials. The composite price series had been a simple-weighted average of surveyed BLS price data prior to 1969. The ERS retail price survey data and the BLS data were combined in 1969 to obtain the published Choice retail beef price used in beef price spread calculations. Thus, price spreads also implicitly included data from the weekly retail meat price survey.

A major development in the evolution of the meat price spreads program was the public release of a weekly report beginning in 1974. USDA was under intense pressure to "do something" about rising food prices at that time. Spreads provided insight into market developments by being used as approximations of industry margins. As spreads widened, the industry was targeted as a culprit in the "battle against inflation." The series was similarly used in later years when meat prices rose sharply.

BLS temporarily ceased publication of retail prices in 1978-81. During that period, ERS calculated the Choice beef retail price series entirely from data collected in the ERS weekly retail meat price survey. When BLS resumed publishing retail cut prices, ERS discontinued its retail meat price survey and resumed using monthly BLS prices.

Weekly retail price series for Choice beef and pork were released to the public by ERS during 1974-81. Also published were net carcass and farm values for beef, wholesale and net farm values for pork, and corresponding beef and pork price spreads. The retail prices were tied directly to the weekly ERS retail meat price survey because BLS releases data only on a monthly basis. When the ERS weekly retail meat price survey was terminated in 1981, the weekly beef and pork price spread summary sheet, which was also discontinued, was being sent to about 500 recipients. Resource constraints were the main reasons ERS dropped the retail survey. Several other reasons, mostly centered on sample design and characteristics, are included in Weekly Prices and Price Spreads for Beef and Pork: A Review and Justification for Program Discontinuation (U.S. Department of Agriculture, July 1981).

History of Concerns

Because price spreads allow the breakout of the consumer food dollar into a farm-value share and a marketing share, some people have inferred that the farm-to-carcass spread is the packer margin and the carcass-to-retail spread is the retailer margin. This is not accurate because other firms (such as transportation and wholesale firms) are also a part of the marketing chain, and actual product mixes handled by firms vary from those used for the spread calculations.

Price spreads have received considerable attention over the years and have been the subject of hearings, examinations, reports, and controversies. Major events regarding price spreads are listed in table 1. These events indicate concerns about who is making or losing money and concerns about procedures used in deriving price spreads.

Audiences

The audiences for and the information desired from beef retail price and price spreads are diverse. ERS is the only public source of a published data series for a composite retail Choice beef price or price spreads. ERS uses retail prices to compute price spreads and consumer expenditures for beef. These data series are widely used by public and private researchers to describe and analyze beef demand. These series are also used to assess the relative well-being of producers, marketing firms, and consumers. Outlook analysts use these series in analyzing current developments, projecting future conditions, and preparing recommendations for decisionmakers. The media are interested in retail price and price spreads for use in popular articles and programs about the food and agricultural sector. Congressional committees periodically

Table 1--Selected beef and pork price-spread events

Date	Event	Who or what
March 1935	USDA publication, The Margin Between Farm Prices and Retail Prices of Ten Foods	Lists data for 1910-34
1946	Research and Marketing Act of 1946, Public Law 733	Designated funds specifically for price spreads
1965-66	National Commission on Food Marketing	Commission composed of senators, representatives, and Presidential appointees
October 1969	Hearings on "Federal Responsibility for Retail Price Increases for Beef"	House Committee on Government Operations
1969	Procedures for estimating beef and pork price spreads were revised	Animal Products Branch, ERS
April 1972	Hearings on beef prices	Subcommittee on Livestock and Grains, House Committee on Agriculture
July 1972	Study by the Subcommittee on Livestock and Grains, House Committee of Agriculture, Meat Prices and the Public Interest	Based on 5 days of hearings during April 1972
1972-74	Period when ERS stressed cost components to explain or divide price spreads	Included a large data gathering proposal at retail (ERS and the consultant firm, Case and Co.)
March-April 1973	Inquiry into "Spread Between Retail Food Prices and Prices Received by Farmers"	Subcommittee on Department Operations, House Committee on Agriculture
April 1973	Hearings on food prices	Subcommittee on Production and Stabilization of Prices, Senate Committee on Banking, Housing, and Urban Affairs
March 1974	Hearings on farm and retail prices of beef	Subcommittee on Agricultural Production, Marketing, and Stabilization, Senate Committee on Agriculture and Forestry

Continued--

Table 1--Selected beef and pork price-spread events--Continued

Date	Event	Who or what
April 1974	Hearings on the rising cost of meat (Ahalt testified)	Subcommittee on Domestic Marketing and Consumer Relations, House Committee on Agriculture
August 1974	Release of a special task force report, "Farm-Retail Price Spreads for Red Meat"	Task force appointed by Secretary Butz, USDA
October-November 1974	Hearings on beef prices and on the rising cost of meat (Ahalt testified)	Subcommittee on Domestic Marketing and Consumer Relations, House Committee on Agriculture
February 1975	Meeting between ERS and top meatpacker representatives as directed and attended by Director of Agricultural Economics, USDA, Don Paarlberg	Explained and discussed price spreads and posed alternative data collection and analysis procedures
April 1975	Meeting between ERS and top retail chain representatives as directed and attended by Director of Agricultural Economics, USDA, Don Paarlberg	Explained and discussed price spreads and posed alternative data collection and analysis procedures
June 1975	USDA publication, Price Spreads and Industry Margins not The same released	Explained and discussed definitions and differences between prices spreads, gross margins, and profit margins
June 1975	Hearings on "Do Retail Food Prices Adjust to Farm Price Changes Without Undue Lag?"	Subcommittee on Domestic Marketing and Consumer Relations, House Committee on Agriculture
September-October 1975	Hearing on price spreads, "1975 Food Price Study" (West testified)	Senate Select Committee on Nutrition and Human Needs
January 1976	Review and Evaluation of Price Spread Data for Farm Foods	An American Agricultural Economics Association Task Force sponsored by their Economic Statistics Committee and ERS
January 1976	Release of Committee Print Food Industry Studies	Senate Select Committee on Nutrition and Human Needs

Continued--

Table 1--Selected beef and pork price-spread events--Continued

Date	Event	Who or what
October 1977-June 1978	Hearings on meat marketing	House Committee on Small Business
July 1978	Procedures for estimating beef and pork price spreads were revised.	Meat Animals Program Area, CED, ERS
September 1978	GAO Report CED-78-170, "What Causes Food Prices To Rise? What Can Be Done About It?"	U.S. General Accounting Office, Comptroller General study
September 1978	GAO Report CED-78-153, "Beef Marketing: Issues and Concerns"	U.S. General Accounting Office, staff study
September 1980	Report from the House Committee on Small Business, "Relationship Between Structure and Performance in the Steer and Heifer Slaughtering Industry"	House Committee staff analysis
May 1981	Discontinued ERS retail meat price survey	1. Data collection began in 1955. 2. Sample increased to 40 retail chain divisions by 1962. 3. Survey results were used to estimate monthly spreads before the monthly data became available. 4. Survey data were used with BLS data to obtain retail prices beginning in 1969. 5. Survey results were the sole source of retail prices beginning in 1978. 6. The retail survey was discontinued in May 1981 and all retail prices used for price spread calculations came from BLS.
September 1983	Hearing on "Review of the Farm-to-Retail Price Spread for Pork" (Duewer testified)	Livestock, Dairy, and Poultry Subcommittee, House Committee on Agriculture
October 1985	Hearings headed by Senator Abdnor (Wilson and Clayton testified), Animal Products Branch submitted a paper, "Analysis of Farm-to-Retail Price Spreads for Beef and Pork, 1980-1985"	Joint Economic Committee, U.S. Congress

exhibit strong interest in these series relative to food price inflation and market performance.

The particular mix of interests among these audiences tends to vary with the season of the year, the phase of the cattle cycle, the direction and rate of change of food prices (especially for beef or pork), and current farm press headlines. As the audience varies from researchers; through farmers, public decisionmakers, reporters, and marketing firms; to the general public, the types of information demanded varies from the availability of only the raw data to the interpretation and analysis of the data to address specific issues.

Sources of Telephone Requests

Sources of telephone requests to one ERS staff member for retail price and price spread information were summarized for a 2-month period, April-May 1987 (table 2). Few, if any, of the requests by these persons, firms, or institutions represent the final use of the data. Rather, each has its own constituency whose size and composition are unknown to us. The telephone list includes both frequent and infrequent callers and represents the typical diversity of "first handler" data requests.

Users of Publications

Publication users probably comprise a list similar to the telephone request group. The mailing list for the Livestock and Poultry Situation and Outlook Report (U.S. Department of Agriculture) consists primarily of universities, agribusiness firms, consultants, government agencies, trade associations, and individuals. Presumably, only part of these readers has a direct interest in retail prices and/or price spreads.

Table 2--Sources of telephone requests regarding retail prices and price spreads, April-May 1987

Caller	Frequency
Media	9
Agribusiness	7
Government	7
University	6
Unknown	6
Brokers	4
Consultants	4
Farm organizations	3
Banks	1
Total	47

Kinds of Questions Asked of Retail Price and Price Spread Data

The following are questions frequently asked of or about retail price and price spread data. Also included are comments on the adequacy of current series for addressing the question.

Retail Beef Price Questions

1. What is the current average retail price U.S. consumers pay for beef per pound? How has it changed?

   The published Choice beef retail composite price answers this question for Choice beef sold through retail foodstores. Prices are published monthly and reflect a weighted average of nine Choice retail cuts of beef collected by BLS in retail foodstores throughout the country. The cuts are weighted by ERS to approximate Choice, Yield Grade 3 steers in carcass proportions. Prices of other beef grades and beef sold through hotels, restaurants, and institutions are not included. Monthly data are available from 1963, with annual data available from 1913.

2. How much do U.S. consumers spend on beef, in total and as a percentage of income?

   An approximate answer is provided in the beef expenditures series published in the Livestock and Poultry Situation and Outlook Report. The Choice beef retail composite price is multiplied by the retail weight of per capita civilian beef disappearance to compute per capita beef expenditures. Per capita expenditures are divided by per capita disposable income to compute beef expenditures as a percentage of income. The Choice retail beef price is a proxy for the price consumers pay for all beef.

3. What affects the demand for beef?

   The Choice retail composite price for beef is the most frequently used price variable for demand analysis, despite limitations described above. Prices for other red meats and poultry are constructed in a parallel manner and are used in demand models.

Price Spread Questions

1. What is the farm share of the consumer beef dollar at the present time? How does this compare with previous periods?

   Published farm and retail prices, taken alone, do not answer this question. However, price spread data, which account for physical conversion factors and net out the value of byproducts, address this question for Choice, Yield Grade 3 steers that are of a specific weight and are processed and sold through retail foodstores. Monthly price spread data represent a snapshot in time, whereas averages over longer time intervals are probably more representative.

2. What total processing and distribution charges make up the difference between the retail price and the farm value of beef?

   Again, published farm and retail prices taken alone are not sufficient to answer this question, but farm-to-wholesale, wholesale-to-retail, and

total farm-to-retail spreads provide an approximate answer for Choice, Yield Grade 3 steers. Monthly price spread data should probably be averaged over longer time intervals to appropriately address this question.

3. How are consumer expenditures allocated by function (such as labor, packaging, advertising, transportation, warehousing, and profits)?

   Cost allocations for gross marketing functions are estimated and published once a year for Choice, Yield Grade 3 steers. Published cost information cover slaughtering, intercity transporting, warehousing and store delivery, carcass breaking, and cutting and merchandising.

   A more detailed breakdown of cost components was published annually through 1980. It included labor, packaging, transportation, business taxes, depreciation, rent, repairs, advertising, interest, energy, and profits. These more detailed cost component values are still computed for internal use but are no longer published because the basic data from which they are estimated is considered out of date.

4. How are consumer expenditures allocated by types of marketing firms (such as wholesaler, packer and processor, and retailer)?

   Price spreads do not directly address this question. However, the breakdown by function into the current cost components does provide information regarding wholesale and retail groupings for Choice steers. These estimates are not expected to coincide with any one existing firm's accounting margins for several reasons. These reasons include functions are combined differently, inventory changes are not considered, byproducts are not included, and product mix is expected to differ.

5. Are profits of marketing firms fair?

   Price spread data cannot answer this question but they can provide an estimate of changes in the allocation of gross dollar allocations among market levels over time. These changes may indicate when an investigation is warranted.

   This type of question illustrates the need to emphasize the differences between price spreads and industry margins. Many people use the terms "spreads," "gross margin," and "profit margin" interchangeably. However, these terms have different meanings. Price spreads are the difference between prices or values at two different market levels for a specific comparable quantity and quality of product at a specific point in time. Price spreads are based on U.S. average data and, therefore, represent industry-wide measures. Gross margin is most often used by the industry as a firm-specific measure, meaning the difference between what a single retailer or packer receives for a product and the price paid for the raw input to that product.

   Industry-wide price spread measures are generally larger than firm-specific meatpacking and retailing gross margins because price spreads also include charges for additional services, such as transportation. However, even if the reverse were the case, no conclusions regarding whether margins or profits for individual foods

were reasonable or excessive could be drawn because the pricing practices of foodstores cannot be evaluated accurately by examining only one retail product.

Profits and profit margins are also typically firm-specific measures. Profits refer to the difference between gross margin and cost, and is usually expressed as a percentage of sales or returns to stockholder's equity. Profit margins are expressed only as a percentage of sales.

6. Are marketing functions or firms wasteful or cost efficient?

Again, price spread data are not designed to answer this type of question, but can provide a general indicator for application to these issues. Special studies, requiring proprietary firm-level data of costs and investment (not readily available), would need to be conducted to appropriately address these questions.

This type of question illustrates the need to emphasize the differences between price spreads and efficiency or market performance measures. Price spreads, by themselves, do not directly measure market efficiency. Price spread data do not contain enough information to indicate whether an industry is cost efficient or inefficient, or whether the costs of marketing, processing, and distributing a product are reasonable or excessive. Price spreads also cannot be used to measure profitability. However, in a longer run framework, price spreads can help identify changes and trends in how consumer dollars are distributed among segments of the marketing chain.

7. Are price changes at one level closely related to price changes at other levels of sale from farm to consumer? Producers especially want to know whether retail prices move down consistently with farm prices and with what time lags?

Studies of price transmissions linking retail Choice beef prices to farm and wholesale values can provide information regarding this question beyond that of studies using farm and wholesale prices because the effects of byproducts are netted out of the farm and wholesale values, and those values are related to a common quantity base.

8. What causes or explains changes in price spreads?

Price spread data can show when spreads change and which segments contain the change. The data cannot explain why a change occurred, although it can be used as an endogenous or exogenous variable when analyzing changes in spreads.

Beef price spreads are one set of information often used to provide some insight into the efficiency and market performance of the beef-marketing system. Price spreads by themselves, however, are not measures of efficiency or performance. Beef price spreads are descriptive and show the current situation in price-spread levels. They show the outcome of pricing behavior but can seldom explain it. Spreads can be used to provide insight into developments regarding margins and profits and may indicate when further investigation is warranted.

CHANGES IN BEEF MARKETING PRACTICES AND BEEF PRODUCTS

When aggregate price indicators are constructed, representative goods within the aggregate category are priced individually and then aggregated using fixed quantity weights. When new products or marketing practices are introduced, conceptual price measurement problems can arise regarding the appropriateness of the chosen representative goods as well as the validity of the fixed aggregation weights.

Meat products can be classified into several identifiable groupings: form, grade, marketing channel, and brand. Changes in product mix among these classification groups can have implications for interpreting current composite measurements of prices and price spreads that use fixed quantity weights or for potential changes in data collection and aggregation procedures.

Changes in Marketing Practices

In the beef industry, marketing practices have changed and several new products have been introduced. Dramatic changes have occurred in the form and way in which beef moves from packers to consumers during the past 20-30 years.

In the past, cattle were slaughtered at the packing plant and sold primarily as carcasses. The carcass sides were usually divided into forequarters and hindquarters but were sold as a unit. Wholesalers or purveyors purchased the beef sides. Wholesalers sold the sides to retail foodstores (the at-home market) where the sides were cut to retail cuts. Purveyors cut the sides and sold the cuts to the food service industry (the away-from-home market) for hotel, restaurant, and institutional (HRI) users.

Iowa Beef Processors (now a subsidiary of Occidental Petroleum Corporation and called IBP) led the move to breaking beef into primal and subprimal cuts at the packing plant and many other firms followed suit. Some retailers built central fabricating plants to divide or cut carcasses into smaller pieces but still bought carcasses for several years. Most retailers have now switched to buying boxed beef.

By 1982, 58 percent of all federally inspected steer and heifer slaughter left the slaughtering plants as boxed beef. Another 11 percent was boxed at nonslaughtering fabricating plants and 14 percent was boxed at food chain fabricators, making 83 percent of all fed beef fabricated before it reached the local foodstore. The 1986 Retail Beef Study published by the Cryovac Division, W.R. Grace and Company, indicates that in 1986 retail foodstores purchased less than 5 percent of their beef purchases in carcass form.

The trend toward boxed beef has moved more cutting and trimming to earlier points in the marketing channel, thereby eliminating much of the processing in retail foodstores and allowing retailers to better match the product mix to consumer demands. Previously, for retailers to sell all the cuts from a carcass, they had to sell less demanded cuts at lower prices or grind the beef and sell it as hamburger. Retailers can now purchase boxed beef instead of carcasses and no longer have to sell in carcass proportions. With boxed beef or more retail-ready cuts, market allocation of beef can be improved by directing products from the packer level to meet more-specific consumer demands.

Boxed beef is usually purchased in vacuum or modified atmosphere plastic packages. Beef in vacuum packaging increased from 16 percent in 1975 to over 80 percent in 1986, according to the Cryovac study. The shift has not only been from carcasses to boxed beef, but also to smaller cuts in the boxes (from primals to subprimals to retail cuts).

Along with the trend to cutting and trimming earlier in the marketing channel, there has also been a move toward more boneless cuts and closer fat trim. The change to more boneless cuts has been slow, but some stores now sell only boneless beef or make an exception only for T-bone steaks. Boneless cuts accounted for 45 percent of all cut sales at foodstores in 1986, up from 23 percent in 1979 according to the Cryovac study. They are predicted to increase to 62 percent by 1989.

In response to growing health concerns, many retailers have moved to much closer fat trim. Many of these firms trim to about 1/4 inch of fat, but some trim off all surface fat. A recent survey of the 200 largest U.S. food retailers indicated that 86 percent of all respondents now have a 1/4-inch trim policy (see John L. Stanton). This does not mean, however, that these stores sell all of their beef trimmed to 1/4 inch.

Precooked and specialty beef items are appearing on the grocery shelf and seem to be well accepted. Precooked beef currently occupies less than 2 percent of the meat case but is predicted to increase to 10 percent by 1989. Frozen food and delicatessen sales with ready-to-eat foods are also growing as a share of the meat marketing mix in the supermarket. A recent article stated that ready-to-eat products were found to be a component of 85 percent of all meals consumed (Supermarket News, May 25, 1987). Many of these products may have beef mixed with other ingredients, which makes price reporting more difficult because of the need to maintain product identity. Prices can be measured for the whole product, but not for the individual components. This presents further problems in calculating price spreads, again because of the necessity to maintain product identity.

As a result of these developments, the product mix sold at retail foodstores has changed over the years. Fresh beef and pork sales have declined in importance relative to total store sales (table 3). Frozen poultry, frozen prepared foods, fresh poultry, fresh fish, and service delicatessens are all increasing their share of store sales, while other categories of meat are not keeping pace.

Although the incorporation of changing products and product mixes into the BLS pricing survey for the CPI is slow, these changes for beef ultimately will mean greater representation in the BLS survey and in the cut prices released to ERS for retail price and price spread calculations. Since most of the beef sector developments discussed here result in beef products being sold that are more-highly processed and higher valued, this implies a gradual move to higher reported average retail beef prices.

Changes are also occurring in the HRI market distribution channel. First, the away-from-home market has continued to grow, from a fifth of food expenditures in the 1960's to two-fifths in 1987. Second, with the move toward more boxed beef, restaurants and institutions began requesting portion-controlled cuts. Third, more processed foods with a greater service or value added component are being sold.

Table 3--Share of foodstore sales for selected meats and other perishable items

Item	1984	1985	Change
	Percent of store sales		
Frozen:			
Meat	0.10	0.08	-0.02
Poultry	.62	.67	.05
Prepared foods	1.31	1.85	.54
Fresh meat	10.63	10.06	-.57
Beef	8.42	7.98	-.44
Lamb	.45	.39	-.06
Pork	1.51	1.42	-.09
Veal	.27	.26	-.01
Fresh poultry	2.55	2.67	.12
Packaged and cured meats	5.16	4.96	-.20
Cured hams and picnics	.88	.81	-.07
Frankfurters	.59	.58	-.01
Packaged bacon	.88	.82	-.06
Packaged cold cuts	1.28	1.25	-.03
Sausages:			
Uncooked	.44	.41	-.03
Cooked	1.09	1.06	-.03
Fresh fish	.96	1.02	.06
Service delicatessen	2.04	2.19	.15
Produce	9.12	9.06	-.06

Source: Supermarket Business, Sept. 1986, p. 83.

Branded Beef Products--A Marketing Development on the Horizon

The beef-marketing channel mostly sells fresh unbranded products. However, some new marketing opportunities are seen for somewhat differentiated beef products sold under a branded label. Retail level branded beef products are a relatively small fraction of total beef tonnage. In the future, this situation may change. In fact, recent acquisitions within the beef-packing industry suggest that branded beef products are likely to become a more significant proportion of retail beef sales, possibly within the next 3-5 years. 1/ Success of branded beef products will depend upon the ability of

1/ Con Agra recently bought the E. A. Miller Packing Company (Utah), Monfort (Colorado), and 50 percent of Swift Independent. These three acquisitions make Con Agra the second largest beef-packing entity in the United States.

firms to identify and produce a profitable, consistent, differentiated product that will allow those firms to capture a market share, preserve their share through product loyalty, and sell their product at a premium.

One type of branded beef product is directed at producing a more health-conscious product. These products are often identified as "natural" beef and are produced without use of antibiotics, growth hormones, or steroids, such as Natural Lite Beef (Bischoff, p 50). "Natural" products can be identified with many other types of beef products and can mean grass fed rather than grain fed beef such as Wyoming Lean Beef (National Provisioner, Feb. 22, 1986, p. 14).

Another market for branded beef would be directed at establishing and maintaining a consistent-quality product. One of the larger retail branded beef programs is Certified Angus Beef (Meat Processing, Nov. 1985, p. 58), which targets a high-Choice to Prime beef product for both retail outlets and HRI markets. Branded beef products are often placed in a separate part of the meat counter in retail outlets. A recent Kiplinger Agriculture Letter indicated that Excel, a major beef packer, is supplying branded beef in case-ready vacuum packs to 150 Kroger stores (Kiplinger Washington Editors, The Kiplinger Agriculture Letter, May 22, 1987).

Branded beef products may lengthen shelf life in foodstores because the product is cut and packaged at the packer level. Packaging at this stage of production allows the packer to deliver products to grocery outlets that are directed at more specific demands and preserves the freshness of those products through vacuum sealed packages. Because branding for other products has meant item and display space proliferation, foodstores have acted to restrict the number of brands and sizes carried to control costs and force product movement. Greater market control of beef production by fewer packing plants could result, with less price variability.

Branded products may also be more widely sold in the HRI beef market, where delivered, portion-controlled cuts are needed. In many high-quality "white table cloth" restaurants, consistent, high-quality meat is critical for success. Packers that can routinely deliver high-quality meat may find it beneficial to put a brand name on the beef that would be recognized at the wholesale level.

ADAPTATION OF COMPUTATIONAL PROCEDURES TO REFLECT DATA AVAILABILITY

Over the years, calculation procedures for deriving retail beef prices and price spreads have been adjusted to reflect changes in data sources used and changes in industry characteristics. Such adjustments, however, have been made periodically in order to maintain a consistent series over time. Changes made in calculation procedures too often would confuse the data user. Major changes were made in 1969 and 1978, so it may be time for another thorough examination and update of the procedures.

Changes in Retail Price Calculations

BLS collects retail prices from a national sample of foodstores for use in computing the CPI. BLS publishes average monthly prices for selected individual foods as a byproduct of this activity. ERS uses these retail price

data to monitor and analyze current price movements and to compute farm-to-retail spreads.

Retail prices from BLS are invaluable to ERS, but they are not ideal for situation and outlook analysis or computation of farm-to-retail price spreads. Several problems have been encountered when using the BLS reported average retail prices to compute a composite price for meat. A major problem is matching the relatively small number of retail cuts to appropriate aggregation weights using carcass proportions (or other composite) for comparison with wholesale and farm-level values. A related factor is that the sample of price quotes for a particular cut is small relative to the number of observations in any aggregate across cuts. It is, therefore, not possible to greatly expand the average price reporting program without a major infusion of funds or changes in sampling procedures. Another problem is that prices are not released by BLS until about 3 weeks following the end of the month in which they were collected.

Supplementing BLS Retail Prices with Weekly Data from Food Chains

In the midfifties, BLS published information for only three cuts of beef and four cuts of pork, raising concerns that the number of meat cuts priced by BLS was too small. In addition, the survey period (3 days each month) did not cover enough days to adequately reflect weekend price specials. To overcome these shortcomings, ERS collected supplemental weekly meat price data in an independent survey from a sample of food chains. The primary motive for starting this survey was to increase the pool of available statistical information on meat prices. Ultimately, however, retail prices and price spread calculation procedures were adapted to combine the food chain price data with BLS data on average retail prices.

BLS discontinued reporting individual product prices during June 1978-December 1980, while revisions were being made in their sampling methodology. The ERS weekly retail price series was the only source of data on retail beef and pork prices during that time.

The transition to the new BLS sampling methodology was completed in 1981 and BLS resumed publishing individual product prices. The methodological changes implemented resulted in more cuts of meat being priced and a better distribution of price sampling periods throughout the week and the month, thereby addressing the initial concerns that led to the independent ERS weekly survey.

Although weekly retail prices for 30 beef cuts and 15 pork cuts were collected by mail from retail food chains, by 1981 only eight markets were being used in the calculation of weekly estimates because of budgetary and resource limitations. Spreads were computed from farm to carcass, carcass to retail, and farm to retail using prices for carcasses and for cattle at major markets from the Agricultural Marketing Service (AMS) and other sources. The annual cost of obtaining, processing, and publishing the weekly and monthly series was about $100,000 per year.

Because of the improved data from BLS and the budgetary constraints, the collecting and reporting of weekly meat prices and price spreads by ERS were discontinued in 1981. (For more information see USDA's report, Weekly Prices and Price Spreads for Beef and Pork: A Review and Justification for Program Discontinuation.)

Table 4--BLS cuts and weights used in computing ERS retail Choice beef price

Cuts	Relative importance
	Percent
Ground chuck, 100% beef	29.5
USDA Choice:	
Roast--	
Chuck, bone-in	14.1
Round, boneless	14.4
Rib, bone-in	7.5
Steak--	
Round, boneless	10.3
Sirloin, bone-in	6.9
Chuck, bone-in	7.6
T-bone, bone-in	4.7
Porterhouse, bone-in	5.0
Total	100.0

Adjusting Retail Weights to Composite of Price Published by BLS

When ERS discontinued collecting retail prices in 1981, they began computing and publishing the composite Choice beef retail price series from a weighted average of monthly BLS retail prices for eight Choice beef cuts and ground chuck. Prices for a given month are available from BLS around the 25th of the following month. USDA generally releases the Choice beef price the next business day. BLS will release prices for individual cuts only if the sample for each cut has a minimum of 85 observations. The nine prices used by ERS in computing the retail beef composite price usually qualify for release by BLS (table 4).

The weights used in deriving the composite Choice beef price roughly correspond to carcass proportions, but the weights include an additional adjustment to improve the linkage with the historical series. ERS assigned these weights in 1981 to produce retail prices that linked consistently with the pre-1981 composite price series. The pre-1981 Choice beef retail price series was computed from weights based on carcass proportions. The new weights were assigned as close to carcass proportion as possible, but were adjusted enough so that the new and old series averaged the same during the 17-month period when both series were available. These weights need to be updated to include ground beef prices, which are now available from BLS.

BLS Beef Prices Designated as "Other than Choice or Prime"

BLS started providing individual prices for four additional cuts designated as "other than Choice or Prime" in January 1987. These data will allow ERS to estimate a better proxy for an all beef price. The Livestock, Dairy, and

Poultry Branch has considered constructing such a series. To do this, they will need to establish cut weights and give ground beef a larger weight. Unfortunately, prices for only four cuts of non-Choice beef are currently available from BLS, and they must be used to represent many fresh beef cuts in an all beef price series. Once appropriate weights are established, the new composite will have to be analyzed for consistency with movements in comparable prices and price indexes.

CPI Revisions and the Quantity and Quality of Retail Price Information

BLS periodically revises the items and weights included in the CPI to adjust for shifts in the relative importance of the components of consumer expenditures. Revisions in 1978 and 1987 incorporated weights from the consumer expenditure surveys of 1972-74 and 1982-84, respectively.

The 1978 revision included other significant changes that affected the price information available from the CPI price survey. These include: (1) introducing a new CPI to cover all urban consumers; (2) expanding and updating the sample of items priced and the consumer expenditure weights used to compute the CPI and numerous components; (3) increasing the number of areas in which prices are collected; (4) updating the sample of retail foodstores in which prices are collected; (5) extending the price collection period to cover more of the month (3 weeks); and (6) improving the conceptual basis and statistical basis used to select outlets and items for regular price collection. These changes make the CPI more representative of the wide variety of goods and services that consumers purchase (Layng).

The procedures used for determining what foods to price in the survey also changed. Before 1978, the CPI consisted of a fixed group of narrowly defined items priced each month. The same detailed specifications of these items were given to all BLS pricing agents. Substitutions were chosen for pricing only when an outlet did not stock the specified item. This approach restricted the range of items represented by the total CPI to about 400 specific items.

Under the 1978 revision, statisticians developed a process called "disaggregation" in which specific items to be priced were selected to represent more general category descriptions called entry-level items (ELI's). For example, the CPI market basket item previously known as Choice grade chuck roast, bone-in, is now one of the specific items that could be chosen for pricing under the more broadly defined entry-level item called chuck roast. Through the disaggregation process, the pricing agent selects the specific kind of chuck roast that will be priced continuously in each outlet. Each kind of chuck roast is assigned a probability, or weight, based on the quantity the store sells. If Choice grade chuck roast makes up 40 percent of all chuck roast sales and if Prime grade chuck roast accounts for another 10 percent, then the Choice grade chuck roast will have a four times greater chance of being chosen than Prime grade. The enumerator assigns weights to categories in other subgroups with regard to kinds of chuck roast, bone status, and process state. After probabilities are assigned, one kind of chuck roast is chosen by a selection process based on the theory of random sampling. The particular kind selected by disaggregation will continue to be priced each month in that outlet. If the respondent is unable or unwilling to provide information on sales, probabilities are assigned based on ranking shelf space or equal probabilities. (See U.S. Department of Labor, BLS, The Consumer Price Index: Concepts and Content Over the Years, Report 517, 1978.)

BLS selects foods to be priced from each of the ELI's. The number of foods selected depends on the relative importance of the expenditure class and the price variability of foods in the class. The sampling procedure ensures selection of foods that rank highest with respect to consumer expenditures. Items to be priced are selected randomly from each class.

BLS agents collect prices by visiting foodstores. They visit the same store on the same day each month. Once items are selected for pricing, their detailed specifications are used to identify the products to be priced in that store each month. When changes occur in items priced to compute month-to-month price movements, only identical items are used to compute price changes. This procedure reduces the impact on monthly movements in the price index from changes in items not priced when regularly priced items are out of stock or part of the sample is updated to introduce new products or delete those no longer sold in large volume.

The sampling procedures introduced in 1978 also provide for a gradual updating of stores from which food prices are collected. One-fifth of the sample outlets are changed annually. When a new outlet is selected to replace an old outlet in the sample, new items are randomly selected to represent ELI's in the new outlet. This mechanism helps keep the sample more current regarding stores and items priced in the sample, thereby allowing a gradual incorporation of new products.

The effect of the 1987 CPI revisions on the average price reporting program was minor relative to the 1978 revision. Most of the methodological changes made in 1978 were not changed in 1987. However, changes in consumer expenditure patterns between 1972-74 and 1982-84, the survey periods for expenditure weights, resulted in some changes in weights, series titles, and definitions. The new relative importances for components of the beef and veal index are shown in table 5. These changes, however, had little impact on retail price availability.

Changes in Wholesale Value Calculations

The wholesale value now reported in the beef price spread statistics is a carcass value. Prior to 1978, the carcass beef price was derived by using weighted average prices from the Midwest and the west coast. A transportation differential was then added to represent a U.S. average price. In 1978, the procedure was changed to use carcass prices for 600-700 pound, Choice, Yield Grade 3 steers at five markets (east coast, Colorado, Midwest, Amarillo area, and Los Angeles). Rather than using a transportation differential, the five market prices were weighted using population and consumption data to derive a U.S. price of carcass beef delivered to the city where consumed.

A current problem with this procedure is that AMS has discontinued publishing data for three of the five markets. To adjust for this, price estimates for the three missing markets are made using the central Midwest market quote and an implicit transportation differential. The Midwest price quote is increased by $3.75 to obtain the east coast estimate and by $0.38 to derive a Colorado price. A price estimate for Amarillo is obtained by multiplying the Midwest price by 1.0049. These current adjustments in procedures are not ideal and should be changed if a carcass value is continued as the wholesale value in price spread calculations.

Table 5--BLS items and relative importances used in computing the beef and veal CPI 1/

Entry level item	Relative importances from Consumer Expenditure Survey covering: 1972-74	1982-84
	Percent	
Ground beef	24.6	36.8
Chuck roast	11.8	8.4
Round roast	9.4	5.2
Round steak	6.2	8.5
Sirloin steak	7.1	7.8
Other beef and veal	40.9	33.3
Total	100.0	100.0

1/ Evaluated using December 1986 prices.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Plans are under way to change the wholesale value to a boxed-beef composite, which would circumvent the current carcass price availability problem. A boxed-beef composite series would probably be based on one or more of the three boxed-beef cutout composite values calculated and published by AMS. A transportation differential would be needed to derive a U.S. average.

If a switch is made from a carcass to a boxed-beef wholesale value, new conversion factors would be required to match boxed-beef prices with retail prices and cattle prices with boxed-beef prices. Byproduct adjustment values would also need to be developed.

Changes in Live Cattle Value Calculations

Farm value calculations prior to 1978 used a weighted average of Choice prices from eight terminal markets in the Midwest and the west coast. The prices were quality designated, but were not explicitly yield graded.

Changes were implemented in 1978 to reflect changes in the industry. First, farm-level prices were more narrowly defined regarding grade. Second, because direct marketing of live animals from feedlots to packers increased, four of the terminal markets were replaced with four direct markets.

As a result of these changes, the farm value calculations now use a simple average of Choice, Yield Grade 2-4 prices for 1,100-1,300 pound steers at eight specified markets. Four are terminal markets (Omaha, Sioux Falls, Sioux City, and South St. Paul) and the others are direct markets (Iowa, Texas, California, and Colorado). Seven of these prices are published by AMS in the Livestock Meat Wool Market News. Prices from the eighth market (Sioux Falls) are obtained by calling AMS.

Changes in Conversion Factors

Price spreads to be meaningful must reflect the difference in value of a comparable amount of product at each level. Retail prices and wholesale and farm values are usually published on a retail weight equivalent basis by ERS. The Livestock, Dairy, and Poultry Branch of ERS also calculates these corresponding series on both live weight and carcass weight bases. These unpublished data are calculated on a monthly basis and are provided to the public upon request.

There are three conversion factors involved in deriving wholesale and farm values that are comparable to the retail prices. The farm-to-carcass conversion factor (also called the dressing percentage) is 61.5 percent. The carcass-to-retail conversion factor (sometimes called the cutout) is 67.8 percent. Multiplying the two (61.5 times 67.8) gives the overall live-weight-to-retail-weight conversion factor of 41.7 percent. The inverse of 41.7 percent is the familiar 2.4 conversion factor, indicating that it takes 2.4 pounds of live animal to obtain 1 pound of retail beef. These conversion factors are used for current price spreads that represent Choice, Yield Grade 3 steers. These factors would not be applicable for an all beef price spread series.

An examination has recently been made of the conversion factor used to adjust carcass weight disappearance to retail weight consumption or disappearance. This value, which reflects all beef consumed, not just Choice, Yield Grade 3 steers, has been 0.74 since 1962. The examination indicated that 0.74 was reasonably accurate and stable during the 1962-85 period. However, analysis of the final 1986 data indicates that the conversion factor will be 0.73 for 1986.

Because the consumption series is for all beef and the price series used in spread calculations are for Choice beef only, different conversion factors are appropriate. The fact that the consumption series conversion factor changed does not necessarily imply that the conversion factor for Choice, Yield Grade 3 beef should change. However, many factors which underlie the revision in the consumption series conversion factor (such as closer fat trimming and more boneless cuts) have similarly affected Choice beef cuts. This suggests that the conversion factors used in the Choice beef price spread series should be examined carefully to see if they should be changed.

CRITIQUE OF CURRENT PROCEDURES FOR CALCULATING RETAIL BEEF PRICES AND PRICE SPREADS

There are a number of problem areas regarding the current procedures used for calculating retail beef prices and price spreads that need to be re-evaluated, particularly in light of the changes that have occurred and potential changes that could occur within the cattle/beef sector. Although not entirely separable, some issues pertain to the retail price series only and others apply to spread-related issues. These are followed by the general issues of sample size and statistical reliability that applies to prices at each marketing level and to spreads.

Retail Beef Price Issues

One important issue is whether the current Choice beef price is an appropriate composite indicator of retail beef sales. This centers on the issue of whether the item and market coverage adequately represents the beef products being sold. Other important retail price issues are the appropriateness of the weighting scheme used for cuts in deriving the composite retail beef price and the timeliness of the reporting of retail beef prices.

Item Coverage

Current retail prices are computed from eight Choice beef prices plus ground chuck. While this represents a small share of potential cuts, Choice beef has been and still is the largest volume method of selling beef (about half of all commercial production in 1986). Growth in non-Choice marketing, however, may mean that average retail beef prices could be less than that indicated by only using Choice beef. Growth in marketings of lean and no-roll (ungraded) beef products and potential introduction of branded beef may also make Choice beef representative of a smaller share of the market. Although the methodological changes in the BLS price collection procedures regarding the introduction of new stores each year partly address this concern about changing product mix, the incorporation of changes is still slower than the market because only 20 percent of stores in the sample are changed each year.

BLS started in January 1987 the monthly release of prices for four additional non-Choice beef cuts designated as "other than Choice or Prime." An all beef price measure can now be estimated with these new cut prices and ERS is currently evaluating the potential for including the new cut prices and ground beef prices into a composite retail price series for all beef. To do this, new cut weights will need to be developed and ground chuck and ground beef will need to be weighted more heavily to reflect cow beef products. While the four new cut prices provide additional information, they must also be used to represent many other fresh beef cuts in an all beef price series.

Only fresh beef products are included in the beef price quotes obtained from BLS. Retail foodstore sales of foods that contain beef (such as frozen dinners) are not represented.

Market Coverage

Current retail meat prices using BLS prices are limited to only foodstores (or the at-home market). Prices from away-from-home markets are omitted. A different mix of meat cuts are sold in the away-from-home market. Away-from-home cuts are usually not measured as individual items, but as part of a meal. However, a price attributed to those cuts would typically be higher than for foodstore items because of the additional food preparation and service costs. Consequently, average retail prices covering all markets would likely be higher with the inclusion of away-from-home food.

BLS only collects and publishes a meal price index for away-from-home markets. Thus, additional data would need to collected to expand average beef price data to explicitly include both at-home and away-from-home marketing channels.

An alternative, which is implicitly done in some applications of the current data, is to assume that the market allocation of beef products preserves price

equilibrium between foodstore outlets and HRI establishments, allowing the argument that the current retail Choice beef price is representative of Choice beef sales throughout all markets. While this assumption is not particularly heroic for the wholesale level, it may not be appropriate for retail sales because it abstracts from the different and usually additional value-added service and preparation components present in HRI sales as compared with foodstore sales. However, it does provide a rationale for implicitly attaching a price to HRI beef sales, separating them from currently available composite meal prices. The difference between marketing costs in HRI establishments and foodstores could be studied in a research project that would determine an appropriate procedure for estimating HRI value-added components needed to derive the HRI beef price.

Weighting Scheme

Changes in items priced affect the weights used to obtain composite retail beef prices. This would be the case in the situation discussed above where new cuts are included.

A weighting scheme is also affected by the purpose for which the composite price is designed. If the composite price measures average prices paid by consumers, then the weights need to reflect consumer expenditure patterns, including imported items. However, if the composite price is designed to reflect equivalent values of a farm-produced animal at different points in marketing channel, then carcass weights are appropriate. The current retail Choice beef price series is of the latter design. It, therefore, does not explicitly reflect the proportions that an average consumer may buy at the foodstore and, thus, is technically inappropriate for those requiring an expenditure-weighted composite price.

Timeliness

Retail beef price and price spread data are not available from BLS until about 3 weeks following the month being reported. Industry analysts would like to obtain these data on a more current basis. Farm and wholesale prices are available earlier, but retail prices are not.

BLS has indicated that the current turnaround time for reporting their price survey data cannot be reduced for several reasons. First, BLS's policy is to maintain all price data as confidential until the entire CPI is released, and they are committed to the current release schedule. Second, the processing of food price data usually is not completed until close to the CPI release date. Prices are sampled during 3 periods within the month to provide a more even workflow in the data processing, and time is required to assemble and process the data.

Once BLS releases the retail cut prices, ERS composite retail beef prices and price spreads are usually available the following business day. Reporting lags also exist in the publication of these data, reflecting the release and distribution schedules of ERS situation and outlook reports.

Wholesale and Farm Values and Corresponding Price Spreads

The major issues related to the value of beef at market levels prior to retail and to corresponding price spreads include the role of boxed beef at wholesale, implications of an all beef price series for farm and wholesale

values and spreads, conversion factors, and the incorporation of lags into the calculation of spreads.

Boxed Beef Value at Wholesale

Boxed beef has replaced carcasses as the most common form in which beef is priced at the wholesale level. ERS is currently conducting research examining how to estimate a wholesale value using boxed-beef prices rather than carcass prices. There are many different prices for wholesale cuts, covering several markets, grades, and other characteristics. These prices could be used to develop a new fabricated-cut composite. ERS could also use one or more of the boxed-beef cutout composite prices published by AMS.

Farm-to-boxed and boxed-to-retail conversion factors would need to be estimated and byproduct calculations would need to be adjusted if the carcass value were to be replaced with a boxed-beef value in spread calculations. In any event, both the carcass value and the boxed-beef value would be published concurrently before the current carcass value series were replaced in the price spread calculations.

All Beef Spread

With the construction of an all beef price series, farm and wholesale values needed to derive corresponding price spread series could also be constructed which would reflect all beef sales. To obtain meaningful series, specific products at the live and wholesale levels would have to be identified to correspond to representative retail-level products. Otherwise, changes in price spreads would be complicated and confounded by a changing mix of slaughter as well as by changing live, wholesale, and retail prices.

Hamburger meat, for example, can be produced from many types of beef animals. To reflect this at the live animal level, the farm value would need to use weights and values for fed beef, nonfed beef, cow beef, and imported beef that correspond to hamburger as well as the wide variety of other retail beef products. While the correspondence of products between marketing levels is relatively straightforward for Choice beef, requiring a minimal set of assumptions, more assumptions that would be less defensible are needed for an all beef series. Improved data collection procedures giving comparable price, quantity, and product mix information at each market level would need to be established and implemented to allow the matching of products moving through market channels.

Conversion Factors

Another major concern is the use of fixed conversion factors that become outdated. Conversion factors represent the quantity of farm and wholesale product needed to produce one unit of related retail product. Conversion factors for the all beef consumption (or disappearance) data have recently been examined, and it was determined that offsetting factors have resulted in no change in that factor for the period 1962-85. However, analysis of the final data for 1986 indicates that the carcass-to-retail conversion factor used for the all beef consumption series will change to 0.73 for 1986, so a corresponding change may be appropriate in the conversion factors used in the derivation of farm- and wholesale-level values corresponding with the Choice beef retail price series.

Incorporation of Lags into the Calculation of Price Spreads

One frequently voiced complaint of cattlemen and retailers is that prices are not lagged in computing the Choice beef price spreads. Using no lags has often been interpreted incorrectly as implying that consumers purchase meat in foodstores on the same day that producers sold it (Ross and Sullivan). Concurrent price spreads and lagged price spreads tend to move in a similar pattern in terms of quarterly or annual averages, but some shortrun differences can occur in monthly or weekly series.

ERS economists have debated the issue of concurrent versus lagged prices for many years without reaching an agreement on whether or not to lag retail prices after farm prices in computing price spreads. The criticism for using concurrent prices is that comparing concurrent retail, carcass, and farm values does not account for the time required to move products through the marketing system, once the live animal leaves the feedlot or finishing barn. If data are not lagged, retail beef prices based on supplies established 2 to 3 weeks ago are compared with live and carcass prices based on today's supply.

The criticisms for using lagged prices are that past research studies have indicated that the lag is not constant over time and that price transmission lags may be different from product movement lags. Consequently, the incorporation of any one lag would be arbitrary.

Any lag also introduces a bias into the raw data needed for research applications. This precludes the analysis of lag structures to determine if changes in prices of livestock and retail products are reflected through the marketing system without undue delay. To illustrate, economic theory of perfect and efficient markets with perfect information implies that instantaneous adjustments in market prices occur in response to each new item of information. Thus, a standard from which to judge the degree of market inefficiency as indicated by price movements is the adjustment in prices at different processing stages relative to concurrent prices at other processing stages measured without lags. Alternative lag structures would be explored within the scope of research studies of market efficiency, but the basic standard for theoretical efficient markets requires the availability of concurrent prices.

Sample Size and Statistical Reliability

The degree of statistical reliability in a survey number depends on the number of observations and how the observations are chosen. Typically, the number of available observations decreases as the level of disaggregation detail increases, leading to less reliable indicators. Similarly, as the time interval covered is shortened, available observations and statistical reliability also decrease.

The retail Choice beef composite price is based on data collected by BLS for the CPI, data considered statistically reliable. About 350-400 observations nationwide are available monthly for the Choice cuts covering three separate time periods within the month. BLS is now providing prices for four additional cuts designated as "other than Choice or Prime." There are only 110-120 observations nationwide for these cuts. These prices are currently being considered for use in a new all beef retail beef price series. Their

statistical reliability is lower than that of Choice beef prices, but they probably still have enough observations to be useful.

Both the current carcass price series and the proposed boxed-beef series at the wholesale level are based on an aggregation of daily data available from AMS. These prices represent actual transactions that AMS tries to verify by talking with both the buyers and sellers on the telephone. Several certified sales are required before a price is published. The number of price quotes for negotiated sales of carcasses has declined in recent years as boxed-beef sales have become predominant. AMS has managed to find enough carcass contracts to continue the series, but they may have to drop the series in the next year or two if the number of observations and statistical reliability diminish.

Cattle prices used for the farm value calculations are also based on an aggregation of daily observations from AMS. Prices from eight markets are averaged, four terminal markets and four direct markets. Use of terminal markets has continued to decline, so the number of observations represented by direct markets is probably larger than those represented by terminal markets.

The degree of statistical reliability required of a survey also depends on the use of the survey results. Generally, a smaller sample size with less statistical reliability is needed to indicate changes in a series qualitatively than is needed in a sample to indicate absolute levels of a series.

Because of their high degree of statistical reliability, prices and price spreads for Choice beef can be used either as indicators of absolute prices and spreads or as indicators of changes in those prices and spreads. Prices at different marketing levels should be fairly accurate because they represent actual market observations. In turn, the price spreads calculated as the differences between those prices should be reasonably accurate indicators of gross returns of all firms involved between the respective marketing levels.

OPTIONS FOR ERS REPORTING OF RETAIL BEEF PRICES AND PRICE SPREADS

The options presented in this section are intended to respond to the scope of issues raised in the earlier critique of current procedures. Because much interest lies with the reporting of beef prices at the retail level and because many constraints lie with data availability at retail, the options presented here focus first on the retail price component. Then, as appropriate in each option, linkages to the wholesale and farm levels required for spread calculations are discussed along with related research issues. Finally, some general issues applicable to each option presented are discussed.

The viability of all options depends on the availability of reliable data. Table 6 presents some of the major sources of cattle/beef sector price statistics. Table 7 presents selected attributes of each option.

Option I--Discontinue ERS Calculations and Reports

Because of increasingly tight budget constraints as well as potentially reduced availability of reliable and representative retail beef price data, it may be difficult to continue to construct a defensible and representative

Table 6--Sources of cattle/beef sector price statistics

Market level	Description
Public sources:	
Consumer	BLS, USDL releases retail level price indexes monthly. BLS provides to the USDA retail prices for selected beef cuts.
Consumer	ERS, USDA derives retail Choice beef composite prices and marketing spreads from BLS retail cut prices and AMS carcass and live animal prices. BLS provides monthly selected beef cut price series for these calculations.
Live animal, wholesale	AMS, USDA releases daily, weekly, and monthly prices for live animals in the Livestock Meat Wool Market News release and to the wire reporting services. Wholesale level meat prices are released daily as a service to the trade. Prices are reported for beef carcasses, cuts, and derived boxed-beef values.
Wholesale	Defense Personal Service Center releases weekly wholesale meat price quotes. These quotes are 3-day averages of prices from National Provisioner's "Yellow Sheet" and Meat Market Research and Reporting Service's The Meat Sheet (private sources).
Private sources:	
Wholesale	National Provisioner releases two wholesale meat quote services for the wholesale and the HRI meat trades, commonly called the "Yellow Sheet" (daily) and the "Green Sheet" (weekly) by the trade. This service releases carcass and wholesale cut values reported by the trade on a f.o.b. Midwest river area basis.
Wholesale	Meat Market Research and Reporting Service releases daily wholesale meat quotes in The Meat Sheet, commonly called the "Pink Sheet" by the trade. Daily wholesale carcass and cut values reported to the trade are included, with adjustments made for freight costs to a common location.
Consumer	Commodity New Service (CNS), Knight-Ridder Financial releases retail level beef prices for 15 cuts each week based on newspaper advertisement quotes in 9 cities. Cut prices, if available, are reported for each city, along with a simple average across cities for each cut. However, no aggregation over the cuts is done.

Continued--

Table 6--Sources of cattle/beef sector price statistics--Continued

Market level	Description
Private Sources:	
Consumer	Neilson releases retail store quantities, prices, and market share information monthly. In the next few years, retail store scanner data details will be made available for meats and selected random weight products.
Trade Associations:	
Consumer	National Cattlemen's Association (NCA) releases midmonth retail beef prices. Cut averages and a single aggregate are published. Prices are based on a simple average of prices for 5 beef cuts, sampled in 3 stores in each of 19 cities.
Potential Sources:	
Consumer	BLS could calculate special series to expand the current statistics available, at some additional cost.
Consumer	ERS could collect special data from retail chain stores. This could be done when scanner data for meats become more widely available and reliable.
Consumer	CASE and Company conducted a feasibility study for ERS in the seventies regarding the collection of data on retail prices and store-specific margins. This type of effort could perhaps be reactivated provided funding and industry cooperation could be obtained.
Consumer	Food Marketing Institute (FMI) could possibly gather from members retail meat prices from a historical perspective after the timeliness value of the data has declined.
Wholesale	American Meat Institute (AMI) could possibly gather from members wholesale meat prices from a historical perspective after the timeliness value of the data has declined.

Table 7--Selected attributes of each option

Item	Option I, discontinue ERS calculation	Option II, current procedure 1/	Option III, change to boxed beef at wholesale	Option IV, supplements option III, all beef price, BLS, 14 cuts	Option V, all beef, BLS aggregate index	Option VI, at-home and away-from-home all beef price	Option VII, supplements options III and IV, timely at-home retail price
Retail, consumer measure	BLS beef and veal index, at home	BLS/ERS Choice beef, at home, 9 cuts	BLS/ERS Choice beef, at home, 10 cuts	BLS/ERS all beef, at home, 14 cuts	BLS/ERS all beef, at home, BLS aggregate index	Consumer all beef, both at home and away from home	Timely all beef, at home, perhaps weekly
Wholesale level	None	Choice, Yield Grade 3, 600 to 700-pound steer carcass	Choice, Yield Grade 3, AMS fabricated cut composite	NA	NA	Some composite of all beef, if done	NA
Farm level	Market basket	Choice steer 1,100-1,300 lb., AMS, eight markets	Choice steer 1,100-1,300 lb., AMS, eight markets	NA	NA	Some composite of all slaughter cattle, if done	NA
Retail weighting procedure	Consumer proportions	Choice steer carcass proportions, byproduct adjustments	Choice steer carcass proportions, byproduct adjustments	Undetermined proportions	Consumer proportions	Undetermined proportions	Undetermined proportions
Data sources	BLS, AMS	ERS, AMS, BLS	ERS, AMS, BLS	ERS, AMS, BLS	ERS, BLS	ERS, AMS, BLS, and others	AMI, FMI, CASE, CNS, and scanner
Timeliness	Same as base, market basket only	Base, CPI release day	Same as base	Same as base	Same as base	Later	Perhaps 2-4 weeks earlier
Computation by ERS	Decrease, market basket only	Base	Same as base	Moderate increase	Less than base	Substantial increase	Increase, potentially large
Cost to ERS	Less	Base	D: Small M: Same as base	D: Small M: Moderate increase	D: Large M: Less than base	D: Large M: Substantial increase	D: Large M: Potentially large
Price spreads	Market basket, farm-to-retail only	Comparable and consistent at all three levels	Comparable and consistent at all three levels	NA	NA	Reflects all beef, if done	NA
Assumptions	Reduced, market basket only	Base	Same as base	Additional	Fewer	Many additional	Many additional

NA = Not applicable.
D = Development costs.
M = Maintenance costs.
1/ Current procedure considered base for comparisons.

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aggregate retail beef price series. Given limited data sources, it may not be feasible to produce an appropriate methodology for deriving a useful aggregate price series for beef that is flexible enough to incorporate changing market conditions. Further, recurrent criticism, misinterpretation, and misuse over the decades of the series that are calculated by ERS suggest that we may not have been successful in educating the public regarding the appropriate applications and interpretations of those series.

In this option, the congressionally mandated requirement to conduct research on spreads would be continued in the ERS market basket activities. We would encourage the disaggregation of the meats category of the market basket into its beef and pork components. However, in these times of particularly tight budget constraints and relatively low food price inflation, the justification of allocating additional public funds to generate price and price spread data of questionable value for individual food items (such as beef and pork) may be more difficult than in earlier years. These funds and resources might better be directed to other division and agency activities.

Option II--Continue Current Procedures

Current procedures report retail beef prices and price spreads for Choice, Yield Grade 3 beef based on carcass proportions. Choice beef is the largest and most nearly homogeneous single quality group of beef sold in retail outlets. Other commonly used beef designations represent widely varying animal types and marketing practices with corresponding reliable retail price and quantity data unavailable.

Factors necessary to link the retail beef price series to wholesale and farm values to produce meaningful spread series are also important. Wholesale and farm values must correspond to a comparable amount of product at different marketing levels. Given data availability, the use of Choice, Yield Grade 3 steers allows the matching of product from the live level, through the wholesale level, and to the retail-product level.

The current coverage of the retail Choice beef price and price spread series is the most defensible on grounds of sample size, statistical reliability of estimates, and product correspondence between marketing levels.

Option III--Change to Boxed-Beef Basis at Wholesale

ERS could change to a boxed-beef basis at the wholesale level. Choice prices at farm and retail levels would be unchanged, but price spreads would be modified to reflect the new wholesale level prices.

Boxed beef has replaced carcasses as the most common form of beef at the wholesale level. This option would examine how to use boxed-beef price data to represent the wholesale value of beef. To support this work, there are many different wholesale cuts available that could be used to develop a new fabricated cuts composite. AMS publishes two Choice, Yield Grade 2-3 boxed-beef cutout composites and a Good, Yield Grade 2-3 composite that could be used. Both the carcass value and the boxed value series would be published for a period of time, but eventually the carcass value series would be discontinued because of the reduced market coverage of wholesale carcass beef quotes.

Two areas would need to be researched before the boxed-beef series could be used for spread calculations. First, conversion factors for farm-to-boxed and for boxed-to-retail would need to be estimated. Second, an evaluation of factors would need to be conducted to derive byproduct allowances.

Option IV--Base a New All Fresh Beef Retail Price on Expanded BLS Beef Cut Prices

This option supplements the reporting of prices and price spreads for Choice beef in option III. Starting January 1987, BLS made available to ERS prices for four additional beef cuts designated as "other than Choice or Prime." These data will allow for the derivation of a better proxy for an all beef composite retail price.

The movement away from the more identifiable Choice products requires that additional assumptions be made. Cut weights will need to be changed to give ground beef a greater relative importance. The four additional non-Choice beef cuts and ground beef still do not give complete product coverage. They will have to represent many other types of retail beef products, and appropriate weights will have to be determined.

The derivation of corresponding spread series will not be included in this option. To obtain meaningful price spread data, specific corresponding products at the live, wholesale, and retail levels must be identified and consistent prices obtained and values derived for equivalent amounts of product. Changes in price spreads would also be complicated and confounded by a changing mix of slaughter if a specific type of animal is not selected. An "all beef" price spread implies the need to calculate farm and wholesale values corresponding to all retail beef sales. This would mean a farm value that correctly weights and values the changing mix of fed beef, nonfed beef, cow beef, and imported beef. Matters are complicated further because a "fed price" is not specific enough data. For example, a fed Prime animal sells for a different price than does a Choice animal and steer prices differ from heifer prices. More details on nonfed beef, cows, and bulls are also needed. Estimating the farm value of imported beef is an additional difficulty. Similar problems exist at the wholesale level.

Option V--Base a New All Fresh Beef Retail Price on BLS Indexes

This option derives an all fresh beef retail price from consumer price indexes and is an alternative to option IV for supplementing the reporting of prices and price spreads for choice beef in option III.

One of the most efficient methods of developing a new statistical series to represent the retail price per pound for all beef is to convert published or specially-constructed CPI's to average prices. Advantages of this procedure are the small amount of computation involved once a conversion factor is developed, and the consistency between the movement in the indexes and average prices. However, the major advantage of this procedure is that it allows the estimated retail price to be based on a comprehensive national probability sample of prices that is routinely updated as new outlets are rotated in and out of the sample of foodstores.

Converting price indexes into average prices could be done by ERS, assuming that BLS would provide the necessary raw price data for one benchmark month.

BLS currently publishes monthly indexes for beef and veal and subindexes for ground beef, chuck roast, round roast, round steak, sirloin steak, and other beef and veal. In addition, an index of selected cuts of beef is published monthly. The beef and veal price may be aggregated from the subindexes using the relative importance for cuts based on expenditure weights for a base period. The steps in converting the CPI for beef and veal to a weighted average retail price are as follows: (1) obtain retail prices for individual cuts of beef for one benchmark month; (2) derive an average price for each cut; (3) weight these prices together using the relative importance for each cut to obtain the weighted average beef price corresponding to the published beef and veal index in the benchmark month; and (4) adjust the derived weighted average beef price from the benchmark month using the CPI for beef and veal.

This procedure would result in a single factor that could be used each month to convert the CPI for beef and veal to the weighted average price per pound. Therefore, the estimated retail price of beef would be a ratio of the CPI for beef and veal.

The currently available special index of selected cuts of beef--which excludes veal and ground beef from the components of the beef and veal index--could be converted to a retail price series on a per pound basis. The computational procedures for selected cuts of beef would be similar to those described for beef and veal. If BLS would agree to provide additional indexes to ERS, similar procedures could be applied to indexes for other specially constructed categories. These categories could include an index that omits veal but includes ground beef or could include indexes that use carcass proportion weights from ERS sources.

One advantage of this approach is that it implicitly allows the indirect use of detailed cut price observations from the CPI survey that would not be released because there were fewer than 85 observations. These observations would be used internally by BLS to derive the specially constructed retail price indexes for any or all of the aggregate categories discussed above. The observations would be released to ERS only in benchmark months when they are needed to derive conversion factors for changing the index to dollars.

This option's objective is to obtain a representative retail price for beef in the at-home market. If linkages to farm and wholesale levels were of interest for deriving price spreads, carcass proportions to appropriate prices at those levels could probably be used. This would require the assumption that consumer weights at retail, which are implicit in CPI data from BLS, are approximately in carcass proportion, an issue that would be a researchable topic. If BLS provides ERS with a special beef price index weighted by carcass proportions, the linkages to wholesale and farm values would be more straightforward.

Option VI--Publish a Consumer Level All Beef Price Series

This option reflects beef prices in both at-home and away-from-home markets. This option will complicate the construction of price spreads if included.

The proposed all beef retail price series (option IV) would use retail store prices for 12 beef cuts, ground chuck, and ground beef, representing monthly sales for at-home beef consumption. This series could be supplemented with HRI sales data two ways.

First, the simplest approach is to assume that the market allocation of beef products preserves price equilibrium between beef going to foodstore outlets and beef going to HRI establishments, allowing the argument that the retail grocery all beef price would be representative of beef sales throughout all markets. While this assumption is not particularly heroic for the wholesale level, it may not be appropriate for the consumer level because it abstracts from the different and usually additional value-added service and preparation components present in HRI sales, compared with foodstore sales. However, it does provide a rationale for implicitly attaching a price to HRI beef sales, separating them from currently available composite meal prices. The difference between marketing costs in HRI establishments and foodstores would need to be studied in a research project that would determine if an appropriate procedure could be derived for estimating HRI value-added components needed to calculate an implicit HRI beef price.

In the second approach, a more explicit pricing of beef sales in HRI establishments would be used. Retail foodstore prices for all beef would again be constructed from BLS data as proposed in option IV. However, new data sources would have to be explored to explicitly account for HRI beef prices. This would probably entail a fairly large-scale ERS survey or a contracted survey, requiring at least 1,500-2,000 observations to be statistically representative. Research would have to be conducted to determine if procedures could be developed to separate the beef component or share from other meal components in observations where only aggregate meal price quotes are available.

If procedures were established for calculating an implicit HRI beef price, aggregation weights would be needed for combining the HRI price with the retail foodstore price. The derivation of these weights would require data that indicates the distribution of product flows for individual cuts sold to retail and HRI markets. These data would be costly to obtain.

Option VII--Publish a More Timely Retail Level Beef Price

Option VII addresses the timeliness issue for reporting retail prices and price spreads for Choice beef. Because the current reporting of the retail Choice beef price data is based on BLS price data collected for the CPI, publication of the retail beef price by ERS depends on the availability of data from BLS concurrent with the CPI release. The time lag is about 3 weeks after the end of the month being reported.

To address the timeliness issue caused by the reporting lag would require a significant new data collection initiative. Such an undertaking could be quite expensive both in initial startup costs and in ongoing maintenance costs, but could provide valuable research data.

Scanner data could be used. USDA is already purchasing scanner data for fixed weight food products. However, reliable scanner data for variable weight products (such as meats) are not yet available. Therefore, other data sources may have to be used to report more timely retail beef prices for a few years.

The Commodity News Service (CNS) (now a division of Knight-Ridder-Financial) and the National Cattlemen's Association (NCA) publish some retail prices that could be used. There are some serious questions regarding statistical reliability of these series as they reflect only a small sample of cuts,

cities, and stores per city. The CNS beef prices are for 15 individual cuts, collected weekly from newspaper advertisements from 9 cities. Data are published for each cut from each city, when available, with a simple average across cities taken to derive average cut prices. Individual cut prices are often unquoted in some cities and those that are reported may range widely across available city quotes. Grades in the CNS sample are not specified. The NCA data are for five cuts in three stores in each of 19 cities and are collected on the second Thursday of each month. Average cut prices are derived by taking simple averages across cities. Also, an aggregate supermarket beef price is derived by averaging over cuts, stores, and cities. The NCA sample also does not specify grade.

Another potential data source that could be explored would be through a special contract for an independent pricing survey such as was proposed by CASE and Company in retail food price monitoring efforts in the seventies. Another interim option until scanner data for beef became more reliable would be to restart an ERS chain store survey such as the one discontinued in 1981. These options, of course, would be more costly.

Potential also exists for cooperation from industry organizations such as the Food Marketing Institute, which represents large retailers, and the American Meat Institute, which represents meatpackers and processors. Firms may be more willing to share confidential data to be controlled and summarized by their own organizations.

Any data sources would require the identification of an appropriate methodology in linking price quotes between weeks and between months. How well such early indicators correspond with the USDA beef price published later would have to be monitored and evaluated. For example, the USDA Choice retail price is generally higher than the CNS price and lower than the NCA price on a monthly basis. Differences in cuts, weights, and sampling methods probably account for most of the differences in price levels among the three series. However, the series do move together fairly well. The USDA series is perhaps a little more stable, but this might be expected because of the underlying larger sample.

Once scanner data for meats become reliable, they will be the preferred source of information. With industry support, a scout program could be started in which weekly computerized scanner data from 30-40 stores would be sent to a processing center. Problems of weighting various stores within an area, weighting areas of the country, and weighting grades of beef would need to be addressed to obtain an accurate U.S. all beef retail price. Once that research was completed, beef price quotes by cut would be aggregated and summary statistics for each week could be derived, with monthly averages calculated as appropriate.

Despite its potential criticism regarding sample size, store distribution, and related statistical reliability issues, the weekly or monthly summary aggregate beef prices would be released publicly to address the timeliness issue. To maximize visibility, these prices could be disseminated using press releases or through the wire services. The derived aggregate would provide a reliable indicator of the composite all beef price derived later from BLS data from the more extensive nationwide CPI survey. The correlation between this type of early indicator and the CPI-based all beef price would have to be monitored and evaluated on a routine basis.

An added benefit of obtaining scanner data from a set of foodstores would be the availability of a large amount of price and quantity data covering most other food items, not just beef. These data could be used in a wide variety of research projects within ERS, particularly in demand analysis.

This option would primarily be interested in the timeliness issue of retail beef price reporting. It would not attempt to derive corresponding preliminary wholesale and farm values needed to derive spreads, relying on the monthly BLS data, which are available later, to derive spreads.

Options Regarding Other Issues

A couple of general issues regarding the reporting of retail beef prices and price spreads merit discussion.

Education of the Public Regarding Price Spreads

Over the years, USDA has been unsuccessful in adequately educating the public about the appropriate uses of price spreads, particularly in conveying to the public the difference between price spreads and margins. In the mid-seventies, USDA published a report, Price Spreads and Industry Margins not The same, to clarify the appropriate interpretations and uses of these terms. Many people use the terms "spreads," "gross margin," and "profit margin" interchangeably even though they have different meanings. Spreads can be used to provide insights to developments regarding margins and profits and may indicate when deeper investigation is warranted.

Two options for addressing this problem of educating the public are possible. First would be to de-emphasize spreads in the reporting of monthly data, thereby eliminating the major source where the misinterpretations begin. Instead, emphasis would be placed on the values of the products at the different processing stages. These product values would remain the retail price, for consumer-level beef products being sold each month; the farm value, emphasizing that it corresponds to products entering the processing chain that month; and the wholesale value, for products at that stage of processing when priced. Spreads could still be derived from the published retail, wholesale, and farm-level data. However, specific discussion of spreads would be in a longer term framework, such as annual reports and special research studies where their appropriate uses and interpretations could be better emphasized and illustrated. Monthly price spread data would still be available and spread-related studies would still be conducted to meet the specific budget allocation for spreads work, but the emphasis would change in the monthly reporting.

A second option would be to initiate another educational effort in an attempt to inform the public of the construction, use, and misuse of retail prices and price spreads. This could be done by re-issuing a publication such as Price Spreads and Industry Margins not The same and by supplementing it with a series of similarly directed articles in situation reports, Agricultural Outlook, Food Cost Review, National Food Review, and other publications where spreads are currently released.

Lags in Spreads Calculations

The incorporation of lags into spread calculations or using concurrent prices is a complex issue with reasonable arguments for different applications on

both sides. Although concurrent and lagged price spreads tend to move in a similar pattern in terms of quarterly or annual averages, some shortrun differences can occur in monthly series that tend to exacerbate problems of data misinterpretation and misuse.

If concurrent prices are used, as is currently done, this presents the basic data to the public and lets the determination of appropriate lags be determined as part of specific studies. Past research studies have indicated that lags may change cyclically, seasonally, and with increasing and decreasing prices. Also, price transmission lags may not be the same as product movement lags. Thus, the incorporation of any specific lag into the routine spread calculations would be somewhat arbitrary.

In support of including lags, some price transmission lag does exist so some lag, although arbitrary, is a closer representation, at least conceptually, than no lag would be. Further, incorporating a lag avoids one rationale for criticism of data series and calculation procedures.

The determination of an appropriate lag could be obtained in two ways. First, representatives of cattlemen have proposed that ERS ask retailer to state the average amount of time elapsed for price transmission from wholesale to retail, based on normal pricing practices of food retailers. Discussions with food retailers indicate that it may be possible to obtain some agreement among them regarding lags. ERS could then apply the lag agreed upon by retailers and cattlemen in developing price spreads for meat. A second alternative approach to determining an appropriate lag would be to conduct a special research study to quantify a lag structure. Including a lag from either of these approaches would possibly defuse the issue of lags and allow more attention to be focused on the issues related to the efficiency of price transmission in related markets.

Because there is widespread disagreement on this issue, even among members of this task force, a reasonable option would be to maintain concurrent farm and wholesale value series to preserve the basic data needed for research, while incorporating lags in a companion series to address the issues raised by public criticism.

REFERENCES

American Agricultural Economics Association and Economic Research Service, Economic Statistics Committee. Review and Evaluation of Price Spread Data for Foods. Washington, DC, Jan. 1976.

Been, Richard O. Price Spreads Between Farmers and Consumers. AIB-4. U.S. Dept. Agr., Bur. Agr. Econ., Nov. 1949.

Bischoff, Juliet. "Retail Connection, MRA Beef: A Consumer Product," Meat Industry. Sept. 1986, pp. 50-51.

Bjorka, Knute. Marketing Margins and Costs for Livestock and Meat. TB-932. U.S. Dept. Agr., Bur. Agr. Econ., Jan. 1947.

Brewster, G. W., and J. M. Marsh. "A Statistical Model of the Primary and Derived Market Levels in the U.S. Beef Industry," Western Journal of Agricultural Economics. Vol. 8, 1983, pp. 34-39.

Cornell University, Department of Agricultural Economics. Operating Results of Food Chains, 1983-1984. Ithaca, NY, 1985.

Cryovac Division, W. R. Grace & Co. 1986 Retail Beef Study. Duncan, SC, 1987.

Duewer, Lawrence A. "Revised Price Spreads for Beef and Pork," Marketing and Transportation Situation. MTS-175. U.S. Dept. Agr., Econ. Res. Serv., Nov. 1969, pp. 23-31.

Duewer, Lawrence A. Price Spreads for Beef and Pork Revised Series 1949-69. MP-1174. U.S. Dept. Agr., Econ. Res. Serv., May 1970.

Duewer, Lawrence A. "Changes in Price Spread Measurements for Beef and Pork," Livestock and Meat Situation. LMS-222. U.S. Dept. Agr., Econ. Res. Serv., Aug. 1978.

Duewer, Lawrence A. "Putting Meat Price Spreads in Perspective," Agricultural Outlook. AO-115. U.S. Dept. Agr., Econ. Res. Serv., Dec. 1985, pp. 29-31.

Duewer, Lawrence A., Kenneth E. Nelson, Terry L. Crawford, and Leland W. Southard. "Analysis of Farm-to-Retail Price Spreads for Beef and Pork, 1980-1985." Prepared for the Joint Economic Committee, U.S. House of Representatives and Senate, Oct. 1, 1985.

Dunham, Denis. Food Cost Review, 1984. AER-537, U.S. Dept. Agr., Econ. Res. Serv., July 1985.

Dunham, Denis. Food Cost Review, 1985. AER-559, U.S. Dept. Agr., Econ. Res. Serv., July 1986.

Elam, Emmett, W. R. H. Brown, and Kenneth E. Nelson. "The Causal (Level-Lag) Relationship Between Price Changes of Choice Beef and Pork at the Retail, Wholesale, and Farm Levels." Unpublished mimeographed paper. Dept. Agr. Econ., Univ. Illinois, 1979.

Executive Office of the President, Office of Management and Budget. Budget of the United States Government--Appendix to the Budget for FY 1988, Department of Agriculture. Washington, DC, 1987, p. I-E15.

Gardner, Bruce L. "The Farm-Retail Price Spread in a Competitive Food Industry," American Journal of Agricultural Economics. Vol. 57, 1975, pp. 399-409.

Heien, Dale M. "A Study of Relationships Between Farm-Level Prices and Retail Food Prices." Unpublished paper prepared for the Council of Wage and Price Stability, Washington, DC, Sept. 1976.

Hudson, Michael A., and Wayne D. Purcell. "Price Discovery Processes in the Slaughter Cattle, Carcass Beef, and Live Cattle Future Markets." Presented to Packer and Stockyards, U.S. Dept. Agr., July 9, 1984.

Ikerd, John E. Analysis of Farm to Retail Beef Price Spreads to Improve Cattle Price Forecasts. Research Bulletin B-771. Oklahoma State Univ., Stillwater, Dec. 1983.

King, Richard A. "Transmission of Week-to-Week Changes in Choice Beef Prices at the Farm Level to Carcass and Retail Levels." Paper presented at the American Agricultural Economics Association annual meeting, Pennsylvania State Univ., Aug. 1976.

Kiplinger Washington Editors. The Kiplinger Agriculture Letter. Vol. 58, No. 11, May 22, 1987,

Knight-Ridder Financial (formerly Commodity News Service). "Weekly Meat Price Survey." Leawood, KS.

Ladd, George W., and Steve S. Duncan. "A Study of Recent Changes in Beef and Pork Margins," Applied Commodity Price Analysis, Forecasting and Market Risk Management. Proceedings of the NCR-134 Conference, Chicago, IL, May 2-3, 1985, pp. 284-301.

Lamm, R. McFall, and Paul C. Westcott. "The Effects of Changing Input Costs on Food Prices," American Journal of Agricultural Economics. Vol. 63, May 1981, pp. 187-196.

Layng, W. John "The Revision of the Consumer Price Index, "Statistical Reporter. No. 78-5. U.S. Dept. Comm., Feb. 1978, pp. 140-148.

Meat Processing, "Applying a Trademark to Prime Quality Beef." Davies Publishing Co., Nov. 1985, p. 58.

Miller, Stephen E. "Univariate Residual Cross Correlation Analysis: An Application to Beef Prices," North Central Journal of Agricultural Economics. Vol. 1, July 1979, pp. 141-146.

Multop, John R., and John W. Helmuth. Relationship Between Structure and Performance in the Steer and Heifer Slaughtering Industry. Report prepared for the Committee on Small Business, U.S. House of Representatives, Sept. 1980.

National Cattlemen's Association. NCA Beef Price Survey. Englewood, CO. Various issues.

National Commission on Food Marketing. Technical Study No. 1. Organization and Competition in the Livestock and Meat Industry. U.S. Government Printing Office, June 1966.

The National Provisioner. "Equality State Finds Market for Wyoming Lean Beef." Feb. 22, 1986, pp. 14-18, 48-49.

Natschke, Patricia. "In-Store Fast-Food Share May Double in Two Years," Supermarket News. May 25, 1987, pp. 1, 24.

Nelson, Glenn. "Farm to Retail Price Spreads and Expenditures for Food." Paper presented at an American Agricultural Economics Association symposium, Clemson, SC, Aug. 1981.

Nelson, Kenneth E. Issues and Developments in the U.S. Meatpacking Industry. Staff Report No. AGES850502. U.S. Dept. Agr., Econ. Res. Serv., Aug. 1985.

Parham, Karen D., and Lawrence A. Duewer. An Evaluation of Price Spread Cost Component Estimates for Choice Beef and Pork. Staff Report No. AGES801215. U.S. Dept. Agr., Econ. Res. Serv., Dec. 1980.

Ross, John W. "Understanding the Meat Industry through Price Spread Information," Meat Processing. Sept. 1984, pp. 28, 31-40.

Scott, Forrest E., and Henry T. Badger. Farm-Retail Spreads for Food Products. MP-741, U.S. Dept. Agr., Econ. Res. Serv., Jan. 1972.

Stanton, John L. An Analysis of Fat Intake From Meat: Current Status. St. Joseph's Univ., Philadelphia, PA. Report to the American Meat Institute, Feb. 3, 1987.

Sullivan, Henry. "Retail Beef Prices Reflect the Drop in Live Cattle Prices." Based on a talk before the Beef Industry Council of the National Livestock and Meat Board, Salt Lake City, UT, Aug. 1985.

Supermarket Business. "39th Annual Consumer Expenditures Study." Sept. 1986, p. 83.

U.S. Congress, House of Representatives, Committee on Agriculture, Subcommittee on Domestic Marketing and Consumer Relations. Rising Cost of Meat. 93rd Congress, 2nd Session, Hearings, April 2-4, 1974.

U.S. Congress, House of Representatives, Committee on Agriculture, Subcommittee on Domestic Marketing and Consumer Relations. Rising Cost of Meat, Part 2. 93rd Congress, 2nd Session, Hearings, Oct. 3, 8, and 22, and November 19, 1974.

U.S. Congress, House of Representatives, Committee on Agriculture, Subcommittee on Domestic Marketing and Consumer Relations. Do Retail Food Prices Adjust to Farm Price Changes Without Undue Lag? 94th Congress, 1st Session, A report on June 10, 1975 Hearings.

U.S. Congress, House of Representatives, Committee on Agriculture, Subcommittee on Livestock and Grains. Beef Prices. 92nd Congress, 2nd Session, Hearings, April 10-11, 13-14, 20, 1972.

U.S. Congress, House of Representatives, Committee on Agriculture, Subcommittee on Livestock and Grains. Meat Prices and the Public Interest. 92nd Congress, 2nd Session, Study, July 5, 1972.

U.S. Congress, House of Representatives, Committee on Government Operations, Special Studies Subcommittee. Federal Responsibility for Retail Price Increases for Beef. 91st Congress, 1st Session, Hearings, Oct. 7-9, 1969.

U.S. Congress, House of Representatives, Committee on Small Business, Subcommittee on SBA and SBIC Authority and General Small Business Problems. Small Business Problems in the Marketing of Meat and Other Commodities. (Part 1-Meat Marketing). 95th Congress, 2nd Session, Hearings, Oct. 13, 17-18, 25, 31, 1977, and May 22, 1978.

U.S. Congress, Senate Select Committee on Nutrition and Human Needs. 1975 Food Price Study, Part 1--Food Prices: The Federal Role. 94th Congress, 1st Session, Hearings, Sept. 30 and Oct. 1, 1975.

U.S. Congress, Senate Select Committee on Nutrition and Human Needs. Food Industry Studies. Prepared by the Committee Staff, January 1976.

U.S. Department of Agriculture, Agricultural Marketing Service. Livestock Meat Wool Market News. Various issues.

U.S. Department of Agriculture, Bureau of Agricultural Economics. The Margin Between Farm Prices and Retail Prices of Ten Foods. Preliminary report, Mar. 1935.

U.S. Department of Agriculture, Bureau of Agricultural Economics. Price Spreads Between Farmers and Consumers for Food Products 1913-44. MP-576. Sept. 1945.

U.S. Department of Agriculture, Economic Research Service. "Facts on Farm-Retail Price Spreads for Beef and Pork," Marketing and Transportation Situation. MTS-196. Feb. 1975, pp. 28-32.

U.S. Department of Agriculture, Economic Research Service. Price Spreads and Industry Margins not The same. ERS-607. June 1975.

U.S. Department of Agriculture, Economic Research Service. Weekly Prices and Price Spreads for Beef and Pork: A Review and Justification for Program Discontinuation. Unpublished manuscript, July 1981.

U.S. Department of Agriculture, Economic Research Service. Livestock and Meat Statistics, 1983. SB-715, Dec. 1984.

U.S. Department of Agriculture, Economic Research Service. Food Marketing Review, 1986. AER-565. Feb. 1987.

U.S. Department of Agriculture, Economic Research Service. Agricultural Outlook. Various issues.

U.S. Department of Agriculture, Economic Research Service. Livestock and Poultry Situation and Outlook Report. Various issues.

U.S. Department of Agriculture, Economic Research Service. National Food Review. Various issues.

U.S. Department of Agriculture, Office of the Secretary. Farm-Retail Price Spreads for Red Meat. Special Task Force Report, Aug. 1974.

U.S. Department of Labor, Bureau of Labor Statistics. The Consumer Price Index: Concepts and Content Over the Years. Report 517. 1978.

U.S. General Accounting Office. Beef Marketing: Issues And Concerns. CED-78-153. Sept. 26, 1978.

U.S. General Accounting Office, The Comptroller General. What Causes Food Prices to Rise? What Can Be Done About It? CED-78-170, Report for the U.S. Congress, Sept. 8, 1978.

Ward, Clement E. Price Spreads for Beef and Pork. OSU Extension Facts No. 497. Oklahoma State Univ., 1986.

Waugh, F. V. Demand and Price Analysis: Some Examples from Agriculture. TB-1316. U.S. Dept. Agr., Econ. Res. Serv., Nov. 1964.

Westcott, Paul C. "Monthly Food Price Forecasts," Agricultural Economics Research. Vol. 33, No. 3, July 1981, pp. 27-30.

Wilson, Ewen M. "Statement for Joint Economic Committee Hearings on September 4, 1985." U.S. Dept. Agr.

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